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SAW Components

SAW Rx 2in1 Filter

GSM1800 / GSM1900

Series/type: B9305

Ordering code: B39202B9305G110

Date: October 16, 2006

Version: 2.3

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SAW Components

B9305

SAW Rx 2in1 Filter

1842.5 / 1960.0 MHz

Data Sheet



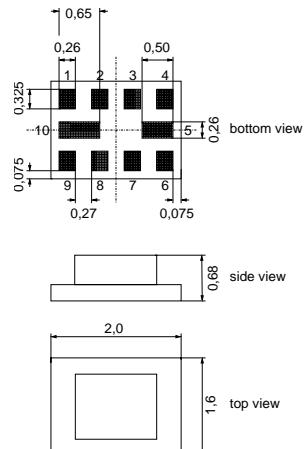
Application

- Low-loss 2in1 RF filter for mobile telephone
GSM1800 and GSM1900 bands, receive path
- Usable passband:
Filter 1 (GSM1800): 75 MHz
Filter 2 (GSM1900): 60 MHz
- Unbalanced to balanced operation for both filters
- Impedance transformation from 50Ω to 100Ω for both filters
- Suitable for GPRS class 1 to 12



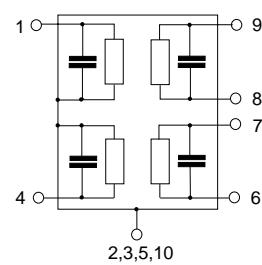
Features

- Package size $2.0 \times 1.6 \times 0.68 \text{ mm}^3$
- Package code QCS10H
- RoHS compatible
- Approximate weight 0.012 g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**



Pin configuration

- 1 Input [Filter 1]
- 4 Input [Filter 2]
- 6,7 Output balanced [Filter 2]
- 8,9 Output balanced [Filter 1]
- 2,3,5,10 Case ground





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B9305

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Characteristics filter 1 (GSM1800)

Temperature range for specification:

$T = -10^{\circ}\text{C}$ to $+85^{\circ}\text{C}$

Terminating source impedance:

$Z_S = 50 \Omega$ (unbalanced)

Terminating load impedance:

$Z_L = 100 \Omega$ (balanced) $\parallel 10\text{nH}$

			min.	typ. @ 25 °C	max.	
Center frequency		f_C	—	1842.5	—	MHz
Maximum insertion attenuation		α_{\max}				
1805.0 ... 1880.0	MHz		—	1.7	2.4 ¹⁾	dB
Amplitude ripple (p-p)		$\Delta\alpha$				
1805.0 ... 1880.0	MHz		—	0.6	1.3	dB
Input VSWR						
1805.0 ... 1880.0	MHz		—	1.6	2.0	
Output VSWR						
1805.0 ... 1880.0	MHz		—	1.6	2.0	
Common mode suppression		S_{cs12}				
1805.0 ... 1880.0	MHz		20.0	28.0	—	dB
824.0 ... 995.0	MHz		20.0	44.0	—	dB
1648.0 ... 1990.0	MHz		20.0	26.0	—	dB
3296.0 ... 3980.0	MHz		20.0	30.0	—	dB
Attenuation		α				
0.3 ... 1000.0	MHz		40.0	57.0	—	dB
1000.0 ... 1705.0	MHz		35.0	39.0	—	dB
1705.0 ... 1785.0	MHz		12.0 ²⁾	17.0	—	dB
1920.0 ... 1980.0	MHz		24.0 ³⁾	27.0	—	dB
1980.0 ... 2400.0	MHz		30.0	34.0	—	dB
2400.0 ... 2500.0	MHz		35.0	43.0	—	dB
2500.0 ... 4000.0	MHz		35.0	46.0	—	dB
4000.0 ... 6000.0	MHz		35.0	44.0	—	dB
6000.0 ... 12750.0	MHz		20.0	35.0	—	dB

¹⁾ -30 °C to +95 °C: 5.0 dB

²⁾ -30 °C to +95 °C: 10.0 dB

³⁾ -30 °C to +95 °C: 10.0 dB



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B9305

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Data Sheet



Maximum ratings

Operable temperature range	T	-30/+85	°C	
Storage temperature range	T _{stg}	-40/+85	°C	
DC voltage	V _{DC}	5	V	
ESD voltage	V _{ESD}	50 ¹⁾	V	machine model, 10 pulses
Input power at GSM850, GSM900, GSM1800, GSM1900	P _{IN}	15	dBm	effective power in the on-state, duty cycle 4:8
Tx bands				

¹⁾ acc. to JESD22-A115A (machine model), 10 negative & 10 positive pulses.



SAW Components

B9305

SAW Rx 2in1 Filter

1842.5 / 1960.0 MHz

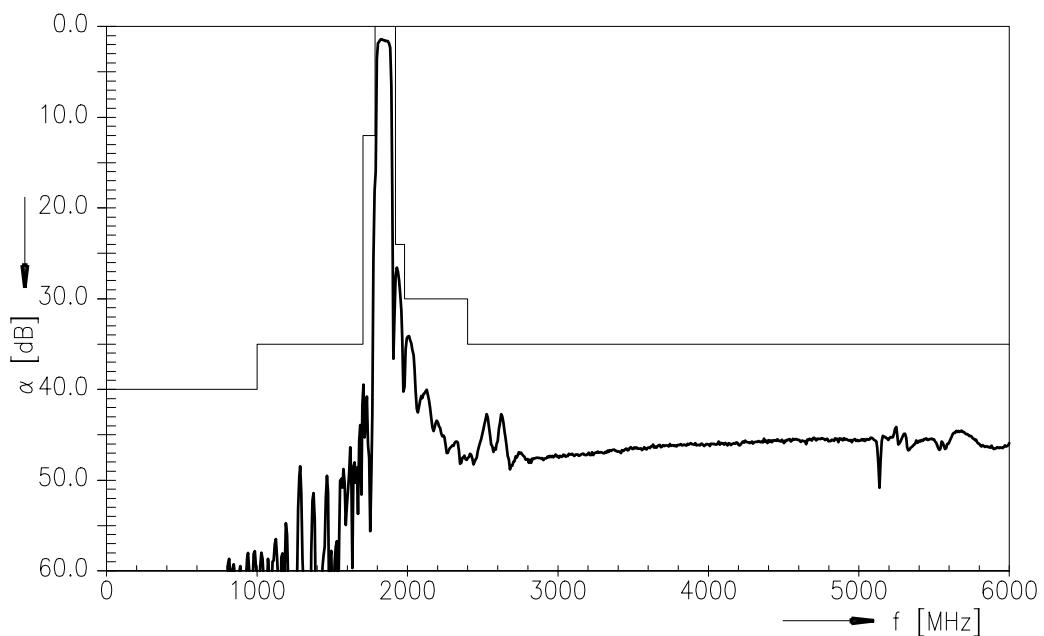
Data Sheet



Transfer function filter 1 (GSM1800)



Transfer function filter 1 (GSM1800) - wideband





SAW Components

B9305

SAW Rx 2in1 Filter

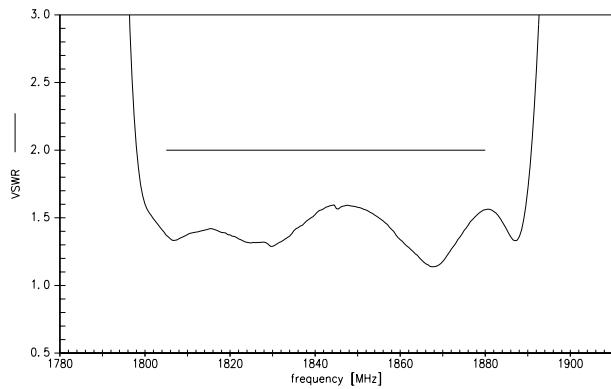
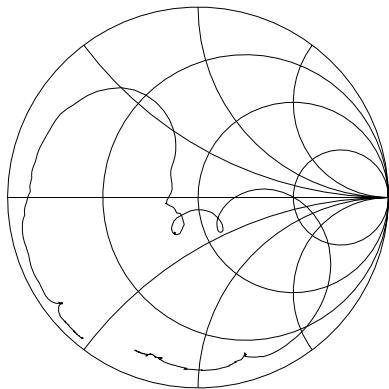
1842.5 / 1960.0 MHz

Data Sheet

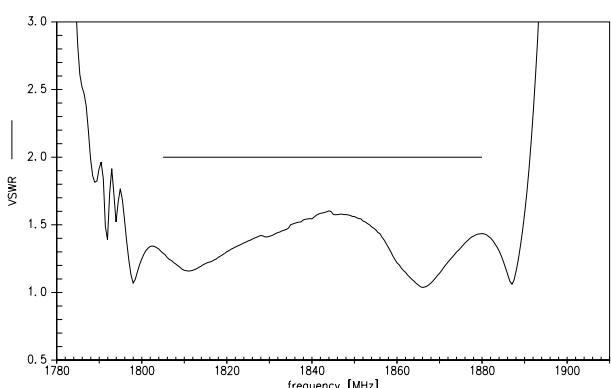
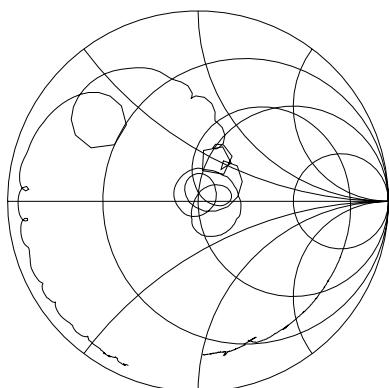


Smith charts filter 1 (GSM1800)

S_{11} function



S_{22} function





SAW Components	B9305
SAW Rx 2in1 Filter	1842.5 / 1960.0 MHz

Data Sheet



Characteristics filter 2 (GSM1900)

Temperature range for specification:

$T = -10^{\circ}\text{C}$ to $+85^{\circ}\text{C}$

Terminating source impedance:

$Z_S = 50 \Omega$ (unbalanced)

Terminating load impedance:

$Z_L = 100 \Omega$ (balanced) $\parallel 12\text{nH}$

			min.	typ. @ 25 °C	max.	
Center frequency		f_C	—	1960.0	—	MHz
Maximum insertion attenuation		α_{\max}	—	1.5	2.5 ¹⁾	dB
1930.0 ... 1990.0	MHz		—	1.5	2.0	
Amplitude ripple (p-p)		$\Delta\alpha$	—	0.6	1.5	dB
1930.0 ... 1990.0	MHz		—	1.5	2.0	
Input VSWR			—	1.6	2.0	
1930.0 ... 1990.0	MHz		—	1.6	2.0	
Output VSWR			—	1.6	2.0	
1930.0 ... 1990.0	MHz		—	1.6	2.0	
Common mode suppression		S_{cs12}	20.0	27.0	—	dB
1930.0 ... 1990.0	MHz		20.0	39.0	—	dB
824.0 ... 995.0	MHz		20.0	27.0	—	dB
1648.0 ... 1990.0	MHz		20.0	36.0	—	dB
3296.0 ... 3980.0	MHz		20.0	28.0	—	dB
Attenuation		α	40.0	50.0	—	dB
0.3 ... 1000.0	MHz		30.0	34.0	—	dB
1000.0 ... 1830.0	MHz		12.0	16.0	—	dB
1830.0 ... 1910.0	MHz		10.0 ²⁾	19.0	—	dB
2010.0 ... 2070.0	MHz		25.0	30.0	—	dB
2400.0 ... 2500.0	MHz		35.0	45.0	—	dB
2500.0 ... 4000.0	MHz		30.0	32.0	—	dB
4000.0 ... 6000.0	MHz		30.0	40.0	—	dB
6000.0 ... 12750.0	MHz		20.0	—	—	dB

¹⁾ -30 °C to +95 °C: 5.0 dB

²⁾ +15 °C to +65 °C: 12.0 dB



SAW Components

B9305

SAW Rx 2in1 Filter

1842.5 / 1960.0 MHz

Data Sheet



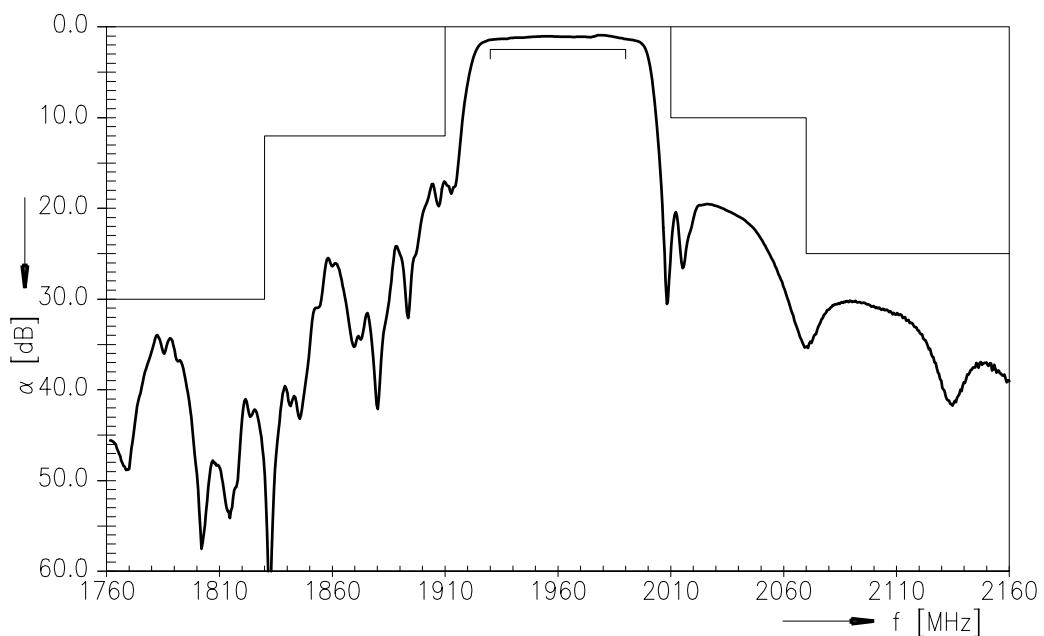
Maximum ratings

Operable temperature range	T	-30/+85	°C	
Storage temperature range	T _{stg}	-40/+85	°C	
DC voltage	V _{DC}	5	V	
ESD voltage	V _{ESD}	50 ¹⁾	V	machine model, 10 pulses
Input power at GSM850, GSM900, GSM1800, GSM1900	P _{IN}	15	dBm	effective power in the on-state, duty cycle 4:8
Tx bands				

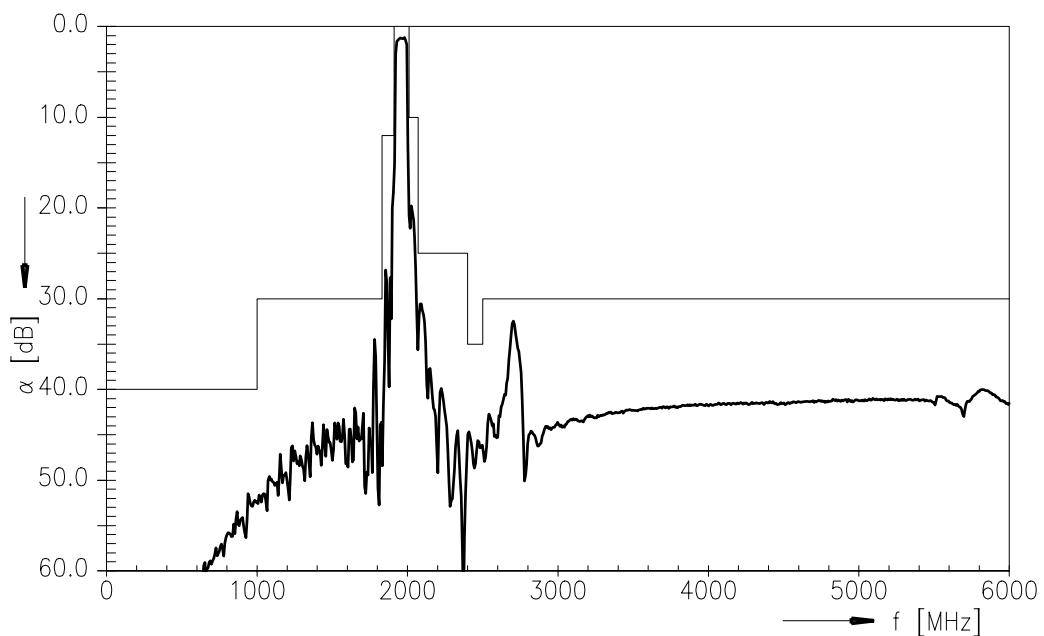
¹⁾ acc. to JESD22-A115A (machine model), 10 negative & 10 positive pulses.



SAW Components **B9305**
SAW Rx 2in1 Filter **1842.5 / 1960.0 MHz**
Data Sheet **SMD**
Transfer function filter 2 (GSM1900)



Transfer function filter 2 (GSM1900) - wideband





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B9305

SAW Rx 2in1 Filter

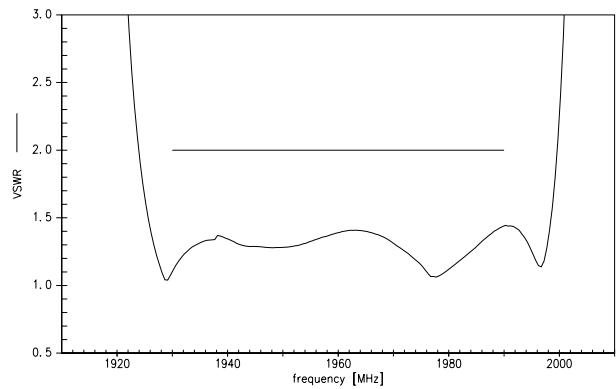
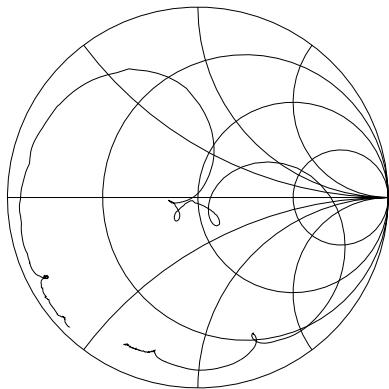
1842.5 / 1960.0 MHz

Data Sheet

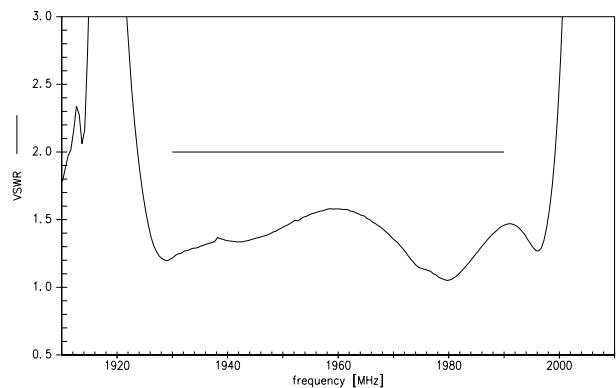
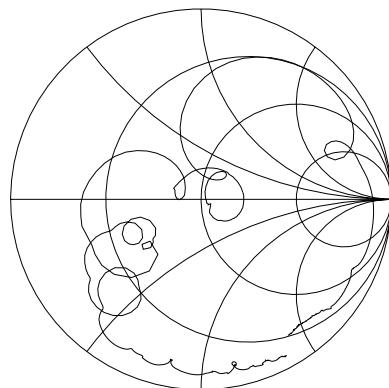


Smith charts filter 2 (GSM1900)

S₁₁ function



S₂₂ function



Please read *cautions and warnings and important notes* at the end of this document.



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B9305

SAW Rx 2in1 Filter

1842.5 / 1960.0 MHz

Data Sheet



References

Type	B9305
Ordering code	B39202B9305G110
Marking and package	C61157-A7-A141
Packaging	F61074-V8152-Z000
Date codes	L_1126
S-parameters	B9305_LB_NB.s3p, B9305_LB_WB.s3p B9305_UB_NB.s3p, B9305_UB_WB.s3p
Soldering profile	S_6001
RoHS compatible	defined as compatible with the following documents: "DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. 2005/618/EC from April 18th, 2005, amending Directive 2002/95/EC of the European Parliament and of the Council for the purposes of establishing the maximum concentration values for certain hazardous substances in electrical and electronic equipment."

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